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STRASBOURG ON THE RHINE. No. I.

VIEW IN STRASBOURG.

If there is any river in Europe more celebrated for the magnitude and political importance of the events which have occurred on or near its banks, it is the Rhine. The gigantic traffic carried on at London gives to the *Thames* a degree of importance which would not be derived from the other towns on its banks; but the Rhine is literally studded along its shores with towns and cities which have had a stamp of celebrity given to them, either by the natural beauties of their situation, or by the historical events which have occurred there. Deriving its birth in the mountainous districts of Switzerland, this noble river flows into the lake of Constanz, (or Constance,) at the east, and emerges from it at the west, flowing westward, past Schaffhausen, to Basle. Here it takes a northern direction towards Strasbourg, passing by which it flows near Baden and Carlsruhe: thence by Mannheim to Mayence. Leaving Frankfort on the Maine (a tributary to the Rhine,) a short distance on the right, we come to Coblentz,—thence to Bonn and to Cologne. Dusseldorf, Wessel, and a few more towns, at length bring us to the mouths of the Rhine. On either hand are a great number of important cities and towns which have not entered into this enumeration.

Among the most distinguished of the places which we have mentioned, is *Strasbourg*, (which is also called *Strasburg* and *Strasburgh*). It is the capital of the Department of the Bas Rhin, or Lower Rhine, in France, and is situated at the extreme eastern end of the kingdom. Before the Revolution, France was divided into about thirty provinces; but among the changes which occurred at that eventful period, was the substitution of *departments* for *provinces*. France was parcelled out on a new system into nearly a hundred small portions, each of which was called a department; and these were named, generally speaking, after the principal river which flowed through them. The department of the Lower Rhine, in which Strasbourg is situated, together with that of the Haut Rhin, or Upper Rhine, comprise together pretty nearly the ancient province of *Alsace*.

Alsace was, in early times, a German Dutchy; but in 1268 the line of its dukes becoming extinct, it was parcelled out to several members of the German empire. By the peace of Munster, in 1648, the part of Alsace belonging to Austria, and to ten free cities of the empire, was ceded to France. Several states of the empire had still important possessions in it, which, at the beginning of the revolution, the first

national assembly declared to be a conquest pointed out by nature herself; because, as they urged, foreign powers could not be allowed to retain possessions within the territory of France without danger. Compensation was promised for the losses sustained by the German owners. Few of them, however, were willing to accept it, and this affair was one of the chief causes of the war which took place soon afterwards between France and Germany. By the Peace of Paris, Nov. 20, 1815, a part of Alsace, viz. *Laudau*, was again separated from France, and re-united with Germany; but the remainder, including Strasbourg, still continued a part of France. It may easily be imagined that a city, thus situated, as it were, between two great kingdoms, has frequently been the seat of war. In the early part of the summer of 1796, when the French army crossed the Rhine, and entered Germany, Strasbourg became a scene of conflict. In the autumn of the same year, when the French were expelled from Franconia, Kehl, with its bridge leading to Strasbourg, very nearly fell into the hands of the enemy. Again, in 1798, it was contested ground between the French and the Austrians.

Strasbourg is not actually situated on the Rhine, but about half a mile to the west of it, at the confluence of two small tributaries to the Rhine, the Brusche and the Ille. Its longitude is 7° 45′ E., and latitude 48° 35′ N. The town is somewhat in the form of a semicircle, and is built on a plain. It is situated in a fertile country, and is well adapted for trade, since the Rhine connects it with Switzerland on the south, and with the Netherlands on the north. The fortifications are very extensive, and the city is entered by seven gates. Towards the east is a citadel.

Although there are one or two good streets in Strasbourg, yet they are, generally speaking, very narrow. The houses are lofty, but deficient in elegance, and are mostly built of a kind of red stone, found in the neighbouring quarries. The city is intersected in various directions by canals, over which are carried numerous wooden bridges. But there is one wooden bridge at Strasbourg, which is said to be the finest bridge in Europe, of that material, its length being 3900 feet, which is more than three times the length of Waterloo bridge. The streets are about two hundred in number, besides several squares, places, &c. The *Place* d'Armée is a square surrounded with good buildings. It is frequented as a public walk. But there are two other places which are greater favourites as public walks, or promenades. One of these is the *Coutadine*, adjoining the city walls; and the other is the *Ruptborshaut*, which is a fine meadow, divided into a number of alleys, or avenues, bordered with trees. There is also a pleasant suburban retreat, called *Robertsau*, which is a little island at the south-east of the town, encompassed by the Rhine and the Ille. It consists of a neat village and a few country houses, and is laid out in many parts with gravel walks, &c. A trip to Robertsau, by the Strasbourgers, resembles in some degree those of the Londoners to Hampstead or Richmond. When Mrs. Trollope visited Robertsau, she saw abundant preparation for entertaining visitors.

The population of Strasbourg is between fifty and sixty thousand. The religion of the inhabitants seems to have been considerably influenced by the changes which have taken place in the government of the province in which it is situated. Strasbourg was one of the first cities of importance to embrace the Reformation; and it had a majority of Protestants among its inhabitants until the latter end of the seventeenth century. It was subjected to France in 1689, and from that time the proportion of Catholics has increased: at present there are supposed to be twice as many Catholics as Protestants. The ancient bishopric of Strasbourg has been secularized, and is now incorporated with France and Baden. It contained five hundred square miles, and about three hundred thousand inhabitants.

Strasbourg is well supplied with public buildings of almost every description. It contains the far-famed cathedral, six Catholic churches, seven Lutheran, and one Reformed. Among its buildings devoted to education, to charitable purposes, or to amusement, are,—a Lutheran academy or university, a Royal Academy, a High School, a Medical School, a Botanic Garden, two public libraries, two hospitals, a theatre, &c. We shall proceed to make a few remarks on such of these as are worthy to be particularized:—and first and foremost, the Cathedral.

The cathedral or minster was founded in 1015, but not finished until 1365. It is one of the most distinguished Gothic structures in Europe. The tower is 474 feet high, being the highest in Europe, and only a few feet lower than the celebrated pyramid of Gezeh, in Egypt. The tower was planned and begun by Erwin, of Steinbach; but, dying in 1318, he had not the pleasure of witnessing the completion of his noble work, which devolved on his brother. The cathedral, seen from a distance, is described as having rather the appearance of a model, constructed with fine wires, than of an enormous structure of stone. The elegant curves of its spiral staircase are seen from top to bottom, and the light is permitted to pass through it on all sides, with a regularity in the form of the apertures, which gives the idea of a transparent embroidery of flowers.

After praising the main body of the building, as being put together with admirable symmetry of proportion, Mr. Russell, in his Travels in Germany, proceeds to say, that the harmony of proportion and the elegance of workmanship appear to still greater advantage in the spire, whose mere elevation, (nearly 500 feet), forms, in the estimation of those who love the marvellous more than the beautiful, the most remarkable feature in the cathedral. There is nothing uncommon in the general form or outline of the tower. The massive base terminates just at the point where, to the eye, it would become too heavy for the elevation, and it is succeeded by the lofty, slender spire, so delicately ribbed that it hardly seems to be supported, and bearing, almost to its pinnacle, a profusion of Gothic ornaments. Yet there is no superfluity or confusion of ornament about the edifice;—there is no crowding figure upon figure, merely for the sake of having sculpture. With more it would have approached the tawdry and puerile;—with less it would have been as dead and heavy as the cathedral of Ulm, which, though exquisite in particular details of sculpture, yet, without being more imposing, wants all the grace and elegance of the fabric of Strasbourg.

When we consider that this cathedral is 130 feet higher than that of St. Paul's at London, we may form some idea of the labour of making an ascent to the top of the spire. The number of steps to reach it is 725, and the nature of the task may be guessed from the following passage from Mrs. Trollope's "Belgium and Western Germany."

I entered the church with the intention of climbing to the top of its spire, but gave it up on listening to the Sacristan's account of the ascent. My son, however, who is not easily discouraged by threatened fatigue, persevered in his determination, and achieved the enterprize; but confessed, when it was over, that it was neither easy nor agreeable. Above half the tremendous height is scaled by steps on the outside of the spire · and although these are protected by a

rail, it is so slight, and its supports are so distant from each other, that it takes but little from its horrors. It is on record that three females have been, a tdifferent times, so overpowered by the giddy eminence which they have reached, when climbing it, that they have thrown themselves off, in a momentary fit of delirium, and been dashed to atoms. The latest of these awful accidents occurred within the last ten years; and the man who recounted the tale to Henry, while he was standing on the self-same pinnacle, told him that he had himself witnessed it. He said that the unfortunate creature was quite a young girl; and the first symptom she gave of her senses wavering, was excessive mirth. She laughed and shouted, as if in an ecstacy; and having reached a point where nothing intercepted her view of the abyss below, she sprang off, screaming wildly as she fell. 'The sound of that cry, as she passed down, was terrible,' said the guide. Terrible indeed! too much to bear thinking of.

We may remark, that a number of little statues which surround the great western gateway of the cathedral, are said to be by the hand of a female, who was daughter to the architect of the tower.

One of the remarkable objects which attract the attention of visiters to Strasbourg, is the cathedral clock, described in our Third Volume, p. 156.

MATERIALS FOR THE TOILETTE. II.

On Soap. 2.

The common mottled soap is prepared somewhat differently by different manufacturers; but the following may be taken as a general outline of the process. If potash be the alkali employed, it is dissolved with water in a small boiler over a slow fire, and the solution is poured into a vat containing common wood-ashes mixed with lime. This filters through the ashes, and is then called the *first ley*. The ashes are then turned, a little more lime is added to them, fresh water is poured on, and a *second ley* is obtained. A large boiler is then supplied with the requisite quantity of tallow, to which about two-thirds of the first ley is added, and a moderate heat is applied until the ingredients are incorporated, which is indicated by their assuming the consistence of stiff glue. If this should not take place in about seven hours, (with 29 cwt. of tallow in the boiler,) more ley is added. This process *kills* the tallow, as it is technically called; and when this is effected, the fire is slackened, and the materials left at rest for some time. Common salt is then added, and stirred in with the other ingredients, until the whole assumes the consistence of a thin soapy substance. The mixture is then boiled for a few minutes, and afterwards left to settle for an hour or two; by which means the spent ley sinks to the bottom, and is pumped off.

An exactly similar train of operations is now performed with the second, or weaker ley; viz., boiling with the tallow, adding the salt, and pumping off the exhausted ley. Again, a third time, these processes are performed, with one-third part of the first ley, which was reserved.

The mixture is then boiled for about three hours, until, by occasional trials, it feels sufficiently firm and dry to the touch, and the ley runs clear off, leaving the soap in small lumps. The boiling is then finished, and the spent ley is finally pumped off; after which a froth, which has collected on the surface of the soap, is scraped off, and the soap is fit for *framing*, which consists of pouring the mixture into wooden troughs with moveable bottoms. When stiff enough to be handled, it is taken out, and cut into oblong pieces, and set to dry and harden in an airy room.

It is considered, as stated by Dr. Aikin, that sixteen bushels of good wood-ashes are equal, with respect to the alkali they contain, to one cwt. of the best pearl-ash, and that this latter quantity will saturate two cwt. of tallow, and produce three and a quarter cwt. of soap; so that twelve parts of tallow will make about twenty of soap. Twelve bushels of wood-ashes are also considered equal to one cwt. of barilla, and the latter quantity will saturate one and a half cwt. of tallow. The boiling of twenty-nine cwt. of tallow with ten cwt. of barilla, and five cwt. of pearlash, requires about eight cwt. of common salt. The effect of the addition of the salt is considered to be twofold: 1st, it produces the *graining*, or separation of the soap from the spent ley, and, 2nd, if the alkali be principally potash, the soap remains in the state of a soft pasty mass, until the addition of the salt; whereas, if soda be the alkali, the salt is not necessary.

The process of making yellow soap is very similar to the foregoing; but the ingredients are different. To make 64 cwt. of this soap, the following are given as the ingredients:—twenty-five cwt. of tallow, seven cwt. of resin, eighteen cwt. of barilla, ten cwt. of black ashes, and half a cwt. of palm-oil.

It has been supposed by some chemists that heat is not chemically necessary in these processes; but that strong ley and long digestion would suffice.

What are called fancy soaps, such as French-white soap, Windsor-soap, &c., are made of materials, and by processes, somewhat different from those we have been describing. To make one thousand lbs. of French-white soap, the materials have been stated as five hundred lbs. of barilla, six hundred lbs. of olive-oil, and one hundred lbs. of quicklime. The barilla and the lime are steeped in water for two or three days, after which the liquor is drawn off, and is found to be a strong soda-ley, extracted from the barilla: the ley must have that degree of concentration that a fresh egg will swim in it. A second and a third ley, each weaker than the former, are prepared in the same way. The exhausted barilla is used for manure.

The oil and the third ley are then boiled, during which the second ley is added gradually. After some hours' boiling, the mixture becomes first milky, and then thick and tenacious. The greatest portion of the strongest ley is now added, and the whole kept constantly stirred. The mixture now begins to separate into a thick soapy substance, and a clear liquid, and goes on thus till the separation is complete. When this condition is attained, the spent ley is drawn off, and the soap tried; when, if it be not sufficiently consolidated, more ley is added, and the boiling repeated. The soap is then finished much in the manner which we have before described.

We sometimes see marbled soaps. These are made by mixing black oxide, or brown oxide of iron, with the other materials, in such a manner as to be only partially incorporated with them, and thus to leave a streakiness.

It will be seen that tallow was used in the English soap before described; whereas olive oil was used in the French soap, which difference is very generally observed between the soaps made in the two countries. It will likewise be observed, that no salt was used in the French soap. This was because the alkali was *soda* instead of *potash*.

Pelletier, the celebrated French chemist, made some experiments on the comparative merits of different oily bodies as a material for soap; from which it appeared, that a certain weight either of lard, suet, or butter, produced a greater quantity of hard soap, than the same weight of any one of several different kinds of oil.

Soft soap differs from those which we have been describing principally in the circumstance that potash is used without salt, and therefore does not harden

when combined with the oil or tallow, which forms the other ingredient. The proportions of the ingredients used in its manufacture are stated by Dr. Ure, from the information of a Glasgow soap-boiler, to be as follow :—273 gallons of whale or cod oil, and four cwt. of tallow, are put into the boiler, with 252 gallons of potash-ley, of such strength that one gallon contains 6600 grains of real potash. It is then heated, and acquires a thin gluey consistency: fourteen measures, each holding twenty-one gallons, of strong ley, are then added by degrees; and the whole is boiled until it attains the state in which it is known as *soft-soap*, the quantity of which from the above ingredients is one hundred firkins, of sixty-four pounds each.

Toilette-soaps are made either as a paste, or in the solid state: in the former case the alkali employed being *potash*, and in the latter case *soda*. The oily ingredient is either hogs' lard, butter, suet, palm-oil, nut-oil, or oil of sweet almonds. The rationale of the manufacture of these soaps is much the same as that of the other soaps that we have described, except that more care is bestowed upon the preparation of the fancy soaps.

Dr. Watson has stated that there is a district near Xen-si, in China, in which a kind of natural soap, called Kien, is produced from the ground. After rain has fallen, if the sun shine, there rise out of the earth thick frothy bubbles, which are collected by the natives, and used for such purposes as we should employ *soap*.

ON SOAP. 3.

There are different kinds of spring-water, but all may be included under two heads; viz., *hard* and *soft*. If water, in the process of emerging from the ground, come into contact with *gypsum*, (sulphate of lime,) or *chalk*, or *limestone* (carbonate of lime), which are most abundant minerals, a portion of them is dissolved by the water. Now these substances are insoluble in *soft* or *pure* water: but if the water be impregnated with carbonic acid, (and all water exposed to the atmosphere contains more or less of this acid,) it dissolves them, in proportion as the carbonic acid is abundant. Such water is called *hard*, because it will not dissolve soap, but decomposes it. Soft water, on the contrary, has no action on soap, except that of dissolving it; and therefore it is desirable to employ the latter whenever soap is used as a detergent.

When soap is rubbed with soft water, a smooth, oily feeling is communicated to the hands, which is not perceived when hard water is employed; in the latter case there is a gritty feeling, and a quantity of insoluble curdy matter is produced, which impedes the action of the water upon the soap. Now soap, as we have seen, is a compound of an alkali and a fatty or oily matter. The latter contains two acids, margaric and oleic, which show a considerable tendency to unite with lime; and at the same time the alkali of the soap has an equal tendency to unite with sulphuric acid. The sulphuric acid is derived from the sulphate of lime contained in the hard water; and, as the soap contains an alkali, united to fat, mutual decomposition takes place:—the sulphuric acid unites with the soda of the soap, and remains in solution, and the lime unites with the margaric and oleic acids; all these form the white curdy matter spoken of above.

If the hard water contain carbonic instead of sulphuric acid, the same result is produced; except that the former acid unites with the lime, and forms carbonate of lime, instead of sulphate.

Soap will dissolve in alcohol; and this solution is employed in chemistry, to distinguish hard from soft water. If a few drops of this solution be put into pure water (that is, water containing no acids and no lime in combination with acids, and no earthy matters, &c.), the two liquids will mix without change, or decomposition of any kind; but if a few drops of this solution be added to hard water, the liquid will become thick and muddy, from the formation of the white curdy matter. Of course some waters are harder than others; and the degree of opacity produced by a given quantity of the solution of soap in different waters will direct us in forming a rough estimate of the saline and earthy contents of each. Hard water may also be distinguished from soft, by placing a few thin slices of soap in a glass of the water. Hardness will be indicated by curdy particles and white flakes around these slices. If the water be soft, and the soap not too abundant, the latter will be entirely dissolved.

The presence of acids alone in water, without lime or other mineral or earthy bodies, will also prevent the solution of soap. Their action is to extract the alkali from the soap; so that the fatty matters, being deprived of the alkali which rendered them soluble, have nothing else to make them dissolve.

It is a very common practice in farm-houses and cottages, to filter water through the ashes of their wood-fires, when such ashes are no longer inflammable. For this purpose a conical vessel, generally made of flannel, is suspended from a wooden frame: in the flannel-cone the wood-ashes are placed, and then water is poured on, which filters slowly through into a pan or bucket, placed underneath to receive it. This liquor is termed in most counties *ley*, and is used with, or supplies the place of, soap. It acts as a detergent, by combining with the greasy matters of dirty linen, and (by rendering them soluble in water), removes them: so that, if soap be used with the ley, the former is greatly economized. Hard water, in fact, becomes soft through this process.

The substance extracted from the wood-ashes is known by the name of *pearl-ash*, from its round *pearly* shape; and from the circumstance of its being produced from *ashes*. This substance is an alkali. It is an impure carbonate of potash, and exists ready formed in almost all trees, plants, and vegetable substances. In America, where wood is abundant, vast quantities of pearl-ash are made by burning vegetable matter to ashes by a slow fire in kilns, or pits dug in the ground, whereby much of the ash is saved, which would be dissipated if burnt in the open air.

Pearl-ash is often indispensable to the laundress in the washing of clothes, being necessary where soft water cannot be procured. If sulphate of lime be the cause of hardness in the water, and pearl-ash be added, the sulphuric acid of the lime quits the lime to unite with the potash, to the exclusion of the carbonic acid; the sulphuric acid and potash (sulphate of potash) remain suspended in the water; and this compound does not leave the water hard, since the sulphuric acid does not unite with the soda of the soap, because it has as great an affinity for potash as for soda. The lime falls down as an insoluble powder, and the soap is perfectly dissolved without decomposition. Crude carbonate of soda is often employed instead of pearl-ash, in which case the soap is not decomposed, because the soda of the soap does not quit it to unite with soda; nor does the sulphuric acid of the lime attach itself to the soda of the soap, because there is enough of free soda thrown into the water for its purpose.

SUPERCILIOUSNESS and knowledge, are but rarely the tenants of an individual mind.—MAUND.

ENGLAND IN THE OLDEN TIME.

No. III.

On Cross-Bows and Bows and Arrows.

National vanity frequently carries us a great way in attributing to Englishmen the possession of powers or talents superior to those of any other nation. This is often extremely unjust to our continental neighbours; but with respect to archery, it appears to be consistent with truth, for many circumstances combine to assure us that the English archers of the olden time excelled those of every other country.

It appears probable that archery was introduced into England by William the Conqueror, and that its use gradually extended, until it became a military weapon. But we have little evidence of the use of the bow, until the reign of Edward III, when an order was issued to the sheriffs of most of the English counties, for providing 500 white bows and 500 bundles of arrows, for the then intended war against France. Similar orders are repeated in the following years; with this difference only, that the sheriff of Gloucestershire is directed to furnish 500 painted bows, as well as the same number of white.

The famous battle of Cressy introduces us both to the long-bow and to the cross-bow, or arbalist, and their relative merits were tested by the following circumstance:—Previously to the engagement there fell a heavy shower of rain, which is said to have much damaged the cross-bows of the French, or perhaps rather the strings of them. Now the long-bow, when unstrung, may be very conveniently covered, so as to prevent the rain from injuring it; whereas the arbalist, or cross-bow, is of a most inconvenient form to be sheltered from the weather.

The form of the long-bow is familiar to us, but that of the cross-bow requires a little description. The cross-bow was much shorter than the long-bow, and was fastened upon a stock or handle, and discharged by means of a catch or trigger, which probably gave rise to the lock on the modern musket. Our engraving represents two cross-bowmen, one of whom is drawing up his bow to its fullest extent, and the other is represented as having just let fly the arrow.

In the battles in which the English were engaged—sometimes against the French, and at other times against the Scotch—for so many centuries, the long-bow was the most valued of all the English arms. In the sanguinary battle fought between the English and Scotch at Homildon, in 1402, the men-at-arms scarcely struck a blow, but were mere spectators of the valour and victory of the archers. The Earl of Douglas, who commanded the Scottish army in that action, enraged to see his men falling thick around him by showers of arrows, and trusting to the goodness of his armour, (which had been three years making,) accompanied by about eighty lords, knights, and gentlemen, in complete armour, rushed forward and attacked the English archers, sword in hand. But he soon had reason to repent his rashness. The English arrows were so sharp and strong, and discharged with so much force, that no armour could repel them. The Earl of Douglas, after receiving five wounds, was made prisoner, and all his brave companions were either killed or taken.

During the reign of Edward IV. an act passed that every Englishman, and Irishman dwelling with Englishmen, shall have an English bow of his own height, which is directed to be made of yew, wych, hazel, ash, or awburne, or any other reasonable tree, according to their power. The next chapter also directs that butts shall be made in every township, which the inhabitants are obliged to shoot at every feast day, under the penalty of a halfpenny when they shall omit the exercise.

In the reign of Henry VIII. three acts were passed for promoting the practice of shooting with the long-bow: one prohibited the use of cross-bows: another was occasioned by a complaint from the bowyers, the fletchers or arrow-makers, the stringers, and the arrow-head makers, stating that many unlawful games were practised in the open fields, to the detriment of the public morals and great decay of archery. These games were therefore strictly prohibited by parliament. The third act obliged every man, being the king's subject, to exercise himself with shooting with the long-bow, and also to keep a bow with arrows continually in his house. From this obligation were excepted such as were sixty years old; or by lameness, or any other reasonable impediment, claimed an exemption; and also all ecclesiastics, the justices of the two benches, or of the assizes, and the barons of the exchequer. Fathers and guardians were commanded to teach the male children the use of the long-bow, and to have at all times bows provided for them, as soon as they arrived at the age of seven years; and masters were ordered to find bows for their apprentices, and to compel them to learn to shoot with them at holidays, and other convenient times. By virtue of the same act every man who kept a cross-bow in his house was liable to a penalty of ten pounds.

Roger Ascham, an author well versed in the subject of archery, and who lived in the reign of Queen Elizabeth, gives many directions concerning the proper equipment for archery. He says it was necessary to have a bracer, or close sleeve, upon the left arm, and which should be made of materials sufficiently rigid to prevent any folds, which might impede the bow-string when loosed from the hand: to this was to be added a shooting glove for the protection of the fingers. The bow, he tells us, ought to be made with well-seasoned wood, and formed with great exactness, tapering from the middle towards each end. Bows were sometimes made of brazil-wood, of ash, of elm, and of several other woods; but yew was generally preferred. With respect to the bow-string, the author was not decided in his preference; those made with good hemp, in accordance with the common usage of the time in which he lived, those manufactured from flax, and those from silk, might be left to the decision of the string-maker. There are, Ascham tells us, three essential parts in the composition of an arrow, that is to say, the stele or wand, the feather, and the head. The stele was not always made of the same species of wood, but varied as occasion required, to suit the different manners of shooting practised by the archers. He commends sound ash for military arrows, and preferred it to asp, which was in his day

generally used for the arrows belonging to the army; but for pastime he thought that none were better than those made of oak or birch: but after all, says he, I hold it better to trust to the recommendation of an honest fletcher. The feathers of the wing of a goose, and especially of a gray goose, he thought were preferable to any others for the pluming of an arrow. Thus in the popular ballad of Chevy Chase, an English archer aimed his arrow at Sir Hugh Mountgomerye, with such skill that it him on the breast, and

> The grey-goose winge that was thereon
> In his heart's blood was wett.

Ascham proceeds to give full directions for the mode of using the bow. In drawing the bow-string, the right hand was, in ancient times, drawn to the breast, but Ascham prefers the method of elevating it to the right ear. The shaft of the arrow below the feathers ought to be rested upon the knuckle of the forefingers of the left hand; the arrow was to be drawn to the head, and not held too long in that situation; but neatly and smartly discharged, without any hanging upon the string. Among the requisites necessary to constitute a good archer are a clear sight, steadily directed to the mark; and proper judgment to determine the distance of the ground. He ought also to know how to take advantage of a side wind, and to be well acquainted with what compass his arrows would require in their flight. Courage is also an indispensable requisite, for whoever, says Ascham, shoots with the least trepidation, is sure to shoot badly.

Henry the Eighth having appointed a great match at archery at Windsor, a citizen of London, named Barlow, an inhabitant of Shoreditch, joined the archers, and surpassed them all in skill. The king was so pleased with his performance, that he jocosely gave him the title of "Duke of Shoreditch," and this title the captain of the London archers retained for a considerable time afterwards. In 1583, in the reign of Elizabeth, a grand shooting match was held in London, and the captain of the archers, assuming his title of Duke of Shoreditch, summoned a suite or retinue of nominal nobility, under the titles of Marquises of Barlow, of Clerkenwell, of Islington, of Hoxton, of Shacklewell, Earl of Pancras, &c., and these, meeting together at the appointed time, with their different companies, proceeded in a pompous march from Merchant Taylors' Hall, numbering 3000 archers, sumptuously apparelled, every man having a long-bow and four arrows. With the Marquis of Barlow, and the Marquis of Clerkenwell, were horn-blowers. 942 of the archers had chains of gold about their necks. This splendid company was guarded by 4000 whifflers and billmen, besides pages and footmen. They passed through Broad-street, the residence of their captain, and thence into Moorfields by Finsbury, and so on to Smithfield, where, having performed several evolutions, they shot at a target.

It seems agreed by modern archers, that if the length of the bow be equal to the height of the shooter, the greatest power can be attained; and the arrow should be about half the length of the bow: with these proportions a strong man can send his arrow from 200 to 240 yards. Ascham said that it required training from early boyhood to hit the target well; and Strutt seems to confirm this in the following passage:—

> I have seen the gentlemen who practise archery in the vicinity of London, repeatedly shoot from end to end, and not touch the target with an arrow; and for the space of several hours without lodging one in the circle of gold, about six inches in diameter, in the centre of the target; this indeed, is so seldom done, that one is led to think when it happens, it is rather the effect of chance than of skill: which proves what Ascham has asserted, that an archer should be well taught early in life, and confirm the good teaching, by continual practice afterwards. We may also recollect that archery is now followed for amusement only, and is to be commended as a manly and gentlemanlike exercise. I remember about four or five years back (about 1795) at a meeting of the Society of Archers, in their ground near Bedford-square, the Turkish ambassador paid them a visit, and complained that the enclosure was by no means sufficiently extensive for a long shot; he therefore went into the adjacent fields to show his dexterity, where I saw him shoot several arrows, more than double the length of the archery ground, his longest shot falling upwards of 480 yards from his standing. The bow he used was much shorter than those belonging to the English archers; and his arrows were of the bolt kind, with round heads made of wood.

Our ancient chroniclers and ballad-writers revel in the feats of archers in the olden time. Robin Hood and his merry men, clad in Lincoln green, have been familiar to us from infancy; and there is another ballad, called "the Names of the Three Archers," written in the same spirit. Adam Bell, Clyne of the Cloughe, and William Cloudesle, are introduced to shoot before the king. The butts or targets, set up by the king's archers, were censured by Cloudesle, as being too large for any but a learner to deign to shoot at: he therefore set up two hazel rods, at 400 yards distance from each other. Standing at one, he shot at the other, and cleft it in two. The king, being much surprised at the performance, told him he was the best archer he ever saw. Cloudesle, to show that his skill was not yet sufficiently known, proposed to exhibit a more astonishing proof of it. He bound his eldest son, a child only seven years old, to a stake, and placed an apple on his head. He then charged him not to move, and turned his face from him, that he might not be intimidated by seeing the arrow directed towards him. Six score paces were measured from the stake: Cloudesle took his station, and

> . . . . Then drew out a fayre brode arrowe;
> Hys bow was great and longe,
> He set that arrowe in his bowe
> That was both styffe and stronge.
> Then Cloudesle cleft the apple in two,
> As many a man might se,
> Our Gods forbode, sayde the Kynge
> That thou sholde shote at me.

Archery, after gradually dying away, has again revived within a few years, and has become a somewhat favourite exercise near London, and probably in other parts of the country. In Scotland the Royal Company of Archers, the King's Body Guard for Scotland, has existed for several centuries, and at the present day comprises among its members a large portion of the Scottish nobility. When King George the Fourth visited Scotland in 1822, the Company claimed the prerogative of acting as Body Guard to him. His Majesty was graciously pleased to recognise their claim, and the Royal Company were thus established as the King's Body Guard for Scotland. They attended his Majesty at court, and on all state occasions during his residence in Scotland, and accompanied him on his visit to Hopetown House, from whence he embarked for London. The captain general has since been appointed Gold Stick for Scotland, and the Royal Company now forms part of the household. There are about 500 members, who meet weekly, and at certain seasons contend for several annual prizes.

IT surely is one of the prominent frailties of human nature, that we are incapable of duly appreciating those favours which are offered to us at little cost. The inference is plain: we place fictitious value on what we desire, and on what we possess; and it may be instructive to carry our researches further into the affairs of this present life, and endeavour to ascertain what real importance attaches to any of those objects which we aim to obtain. It may be useful, although disagreeable, to discover that we run after bubbles, which burst in the hand.—MAUND.

ON DIVING.

It was part of the sublime scheme of creation, that man should have dominion over all living creatures upon the face of this beautiful world, which the Almighty assigned to him as a dwelling place. The fish of the sea and the fowls of the air are alike the subjects of man's controul; and not content with subduing them, and learning their structures, habits, and modes of existence, man has attempted to become familiar with their haunts. Unrestrained by physical difficulties, gifted with ingenuity and energy, and calling to aid all the resources of science, art, and industry, man soars above the clouds, or penetrates into the chambers of the deep, in search of the riches which nature has buried therein, or to recover the wealth which he himself has already lost.

The difficulties which the diver has to encounter are consequent on his physical formation. The moment he plunges below the surface of the water he is removed from the atmosphere which is necessary to his existence. If we hold the mouth and the nostrils, so as to prevent the lungs from communicating with the external air, great pain and inconvenience will soon be experienced. No one can continue the act beyond a minute or a minute and a half: yet this is the act performed in the simplest and rudest state of diving, where, by constant practice, men have inhaled at the surface, a sufficient quantity of air to last them for two minutes under the surface of water. If, previous to the descent, the carbonic acid existing in the cells of the lungs be expelled by four or five forcible exhalations, and then a full inhalation of atmospheric air be made, the diver, it is said, can, without difficulty, remain two minutes under the surface of the water.

A person can also remain a longer time under water if, previous to his submersion, he inhale compressed air; such, for example, as the air in a diving bell, already many feet below the surface of the water. Mr. Brunel relates, that at the time when he descended in a diving bell, to examine the breach which the river had made in the tunnel under the Thames, he lowered the diving bell about thirty feet to the mouth of the breach: that this being found too narrow to admit the bell, he took hold of the end of a rope, and dived himself down into the opening: having remained down about two minutes, his companion in the bell becoming alarmed, gave the signal to those above for pulling up: but Brunel not being prepared for the signal, had hardly time to secure the rope which he had relinquished, and was surprised on getting into the bell, to hear that he had been in the water two minutes. On re-descending, he found that he could remain under water that space of time without difficulty, because the air in the bell being condensed by a column of water nearly thirty feet high, contained nearly double the quantity of air in the same space, and thus nearly a double supply to the lungs.

The unassisted diver has also another difficulty to encounter, besides that of holding the breath; the pressure of the water on the chest becomes so great at great depths, as to be almost intolerable. This pressure increases upwards of sixty pounds on every square foot on the surface of the diver's body, for every foot of descent; and if the chest expose half a square foot of surface, the pressure thereon, at the depth of fifteen feet, is equal to 450 pounds; a load which tends to expel the air enclosed in the lungs, and consequently calls for great muscular exertion on the part of the diver, and often produces bloodshot eyes and spitting of blood.

Diving can therefore only be regarded as a rude art, adapted to a rude people, without much mechanical aid. Numerous wonderful tales have been related of the feats of some celebrated divers. One of these stories we will detail in a second article on diving, our present object being to afford a succinct account of the art and its history, up to the invention and general use of the diving bell, to which latter subject we propose to devote a separate article.

Among the divers in various parts of the world, those of Ceylon, engaged in the pearl fisheries, are celebrated. Some of these divers are said to have remained six minutes below the surface of the water, but strong doubt exists regarding this statement. The late Admiral Hood, when at Ceylon, determined to test the powers of the best pearl divers by an appeal to his own watch, and found the ordinary time which a diver could remain submerged to be one minute; and, in one or two cases, a minute and a half. In this pearl fishery there are generally ten divers to each boat: five descend into the sea at a time, while the remaining five remain above, to renew their strength. In order to hasten their descent a large stone is used with a rope attached to it, which the diver seizes with the toes of his right foot. Grasping another rope with his right hand, and keeping his nostrils shut with his left, he soon reaches the bottom. He speedily collects oysters, puts them into a net which is hung about his neck, and, upon giving a signal he is hauled up immediately by those in the boat.

These divers are all Indians, and have undergone much previous training. They often descend forty or fifty times a day: the exertion is very great, and they frequently discharge water and blood from their mouths, ears, and nostrils. Some stuff their ears, and cover their bodies with greasy substances: they do not eat while in the boats, since they find that food in the stomach is oppressive while engaged in diving. They are often exposed to a dreadful enemy while under water, viz., the ground-shark which inhabits these seas: some of the divers are expert enough to avoid this animal, but all of them are extremely apprehensive of him, and consult their priests or conjurers before they go upon a diving excursion.

The divers for sponges in the Archipelago are said to descend with a piece of sponge dipped in oil in their mouths, the object of which is to calm the small waves on the surface of the sea, which prevent the light from being so steadily transmitted to the bottom as is necessary to enable the divers to discern the objects they are in search of. By spitting out a little oil, it rises to the surface, and becoming diffused, it calms the waves, and a clear and steady light is transmitted to the bottom.

The writer has heard of a jewel, dropped by accident into a rough but shallow sea, being recovered by throwing a little oil on the waves, which enabled a person sent in search of the trinket to discern it with ease.

Some of the natives of the South Sea Islands, by constant practice from infancy, become very expert divers, and swim round the ships which visit their coasts, for the purpose of begging small articles of European manufacture. It is said that when a nail or other small article, is thrown overboard, they never fail to recover it by diving; and on one occasion, a smith's anvil having fallen overboard, the natives secured it by diving many times, rolling it over towards the shore at each descent.

We come now to notice a few contrivances which have been invented for assisting the diver in his attempts to remain under water for an indefinite length of time. It is obvious, that to be successful, the

objects of every diving apparatus must be to supply the diver with fresh air, and prevent the entrance of the water into the mouth, nostrils, and ears. These objects have been more or less attained by water-tight armour, made so strong as to protect the body from the pressure of the water at great depths; together with respiratory tubes, passing up above the surface of the water, so as to enable the diver to breathe. This forms one class of apparatus. A second class consists of water-tight vessels of metal, inclosing the diver, together with a quantity of air, to support respiration for a limited period, such as twenty minutes. Apparatus of this kind enables the diver to protrude his arms by means of flexible sleeves; glass lenses are also provided, through which the diver can witness and direct his own operations.

These descriptions of apparatus are nearly all objectionable, and far inferior to the diving bell, which we shall hereafter describe. The best armour, perhaps, that has ever been contrived, is that known by the name of its inventor, M. Klingert. The accompanying figure represents the diver equipped in Klingert's armour. This dress is made of strong tin plate, in the form of a cylinder, consisting of two parts, the head-piece, or helmet, and the body. In addition to this, there is a leathern jacket, with short sleeves, and a pair of leathern drawers; both are made water-tight, by being buttoned to the metal part of the dress, where they are secured with brass hoops going round the leather and the metal on the outside. The air is supplied by two distinct flexible pipes, proceeding from the inside of the helmet to the surface of the water: one pipe is for inhaling the air, and terminates in an ivory mouth-piece, which the diver embraces with his mouth: the other enters the helmet at the same place, and merely opens into the interior of the machine, so as to allow the foul air to be discharged. The diver draws in fresh air with his mouth, and discharges it with his nostrils, and from the inside of the machine it is propelled by inspiration, the expansion of the chest contracting the space between it and the armour, and forcing out exactly as much air as is drawn in, so that a due equilibrium is thus constantly maintained.

To the metal dress hooks are attached, on which weights are hung, to keep the diver down. He makes signals by means of a rope attached to his arm, or by speaking through the tube. When he wishes to ascend, he unhooks the weights and fixes them to a rope let down for the purpose, and then, being lighter than his own bulk of water, he ascends.

Klingert's armour is still in use in the construction of hydraulic works, in places inaccessible to the diving-bell.

M. Klingert is also the inventor of a diving chest of the form of a hollow cylinder, capable of holding fifty-eight cubic feet of air, which he calculated would enable the diver to remain submerged about two hours. This vessel (used in conjunction with the armour) was suspended from a boat, but could be raised or lowered by means of a pump compressing or dilating the inclosed air. From a description of this diving chest in the *Encyclopædia Britannica*, it appears, that the ballast is so adapted to the size of the machine, as to make it sink so far, that only a cubic foot of it remains above water. In this state an additional weight of 100 lbs. will depress it below the surface, or make it sink to the bottom. The effect of adding extra weights, is produced by diminishing the volume of contained air by condensing it into a smaller space. To accomplish this, a large cylinder is applied to the bottom of the vessel, and provided with a piston, which by a rack and pinion, can be moved from one end of the cylinder to the other, when the diver turns a handle passing through the side of the machine, and communicating motion by a worm and wheel to the pinion of the rack. The lower end of the cylinder opens to the water and the upper end opens within the machine; therefore, when the diver turns the handle in the direction to raise the piston in its cylinder, it necessarily diminishes the bulk of the included air, and the machine sinks; but on depressing the piston in the cylinder it will ascend again. The inventor proposed to furnish the machine with two small oars to move it in the water, and an anchor or grapnel, to make it fast whilst the diver walks about on the bottom, within the limits of the length of the pipe, to examine sunken bodies and discover the best mode of raising them.

Various other forms of diving apparatus have been contrived, a description of which, would be curious rather than instructive. We have already said enough to show the general nature of diving apparatus introductory to an account of the most useful and important of all diving machines yet contrived, viz. the Diving Bell; to which we shall devote a separate article.

MAN EQUIPPED IN KLINGERT'S ARMOUR PREPARATORY TO DIVING.

We read, that in certain climates of the world, the gales that spring from the land, carry a refreshing smell out to sea; and assure the watchful pilot, that he is approaching to a desirable and fruitful coast, when as yet he cannot discern it with his eyes. And in like manner it fares with those who have steadily and religiously pursued the course which Heaven pointed out to them. We shall sometimes find by their conversation towards the end of their days, that they are filled with hope, and peace, and joy: which, like those refreshing gales and reviving odours to the seaman, are breathed forth from Paradise upon their souls; and give them to understand with certainty, that God is bringing them into their desired haven.—Townson.

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